Fire Program Analysis – Preparedness Module
Implementing Modeled Results in the Real World

Topic: Implementing Fire Program Analysis (FPA) outcomes.

Issue: There is widespread belief that FPUs are required to implement the exact outputs resulting from the FPA-Preparedness Module analysis.

Background: Numerous Fire Planning Units have indicated that they will have a difficult time implementing the exact results from FPA. The modeled organizational mixes of fire resources are not likely to match the current fire resource mix of their existing organization.

Implementing, verbatim, the FPA outputs was never the intent of FPA. FPA was designed with numerous simplifying assumptions to deliver solutions that would provide insight toward a more cost-effective mix of resources. These outputs are meant to be the beginning of the decision making process.

The Model World: Analyzing the fire program is complicated. Experienced wildland fire decision-makers are familiar with the multitude of variables that affect wildland fire decisions and the high degree of uncertainty that accompany them. Since the fire management program is a complex system, we use models to represent that system, in an attempt to aid us in the decision making process. A model can be defined as, "*a purposeful representation of the real world*".[1] By definition, every model is an abstraction of reality that enables the user to simplify the problem while retaining those factors that are most important to generate the desired outcome. Therefore, this model should be judged on its ability to produce an annual budget and an annual list of fire resources.[2] The FPA purpose is to adequately address the workloads and performance goals of most FPUs. There will always be some programs that are outliers and will require adjustments to model outputs

We have defined the initial response to wildland fire in the context of a resource allocation problem across an entire fire season for a single Fire Planning Unit (FPU). FPA attempts to answer the question: What is the optimal set of fire resources to have on hand for a single fire season at a given cost constraint? The optimization model employed by FPA-PM is an analytical technique that is often used to solve resource allocation problems such as this. The FPA system also uses other modeling techniques, such as simulation and expert opinion to model fire behavior and Fire Management Leadership, respectively. The outputs from this analysis can give us valuable insight into how the modeled world compares to the real world.

Prepared by: FPA Core Team
Reviewed by: FPA Steering Committee
9/6/2005
For more information, see the FPA web site fpa.nifc.gov

The Real World: The real world, which the FPA model attempts to represent, is much more complex. Unlike our model world, the real world does not know when and where fires will occur in the coming fire season, have homogeneous fuel types, constant slopes and weather, fires that occur at a single workload point, or predictable fireline production rates. Another distinction between the modeled world and the real world is that the model world only analyzes the initial response to wildland fires and not the full fire management program.

These differences highlight the fact that the outputs from FPA (model world) will be used to begin a dialog about strategic fire resource allocation. By themselves, FPA outputs are not the decision about FPU fire resource allocation.

Interpretation: The fact that the real world varies from the modeled world does not invalidate the FPA analysis. The value of any model is in providing insight and understanding of the real world.

The modeled results should be viewed as a good starting point for discussions between modelers and decision makers; or in the case of FPA, results in a discussion between fire planners, fire managers, and agency administrators. These discussions should lead to greater understanding of the system being modeled. Managers and Agency Administrators will very likely ask questions that could be illuminated by analyzing additional scenarios within FPA model.

The modeled results of FPA will be used to develop and eventually deliver budget information to local units. A tremendous amount of input and output data can be reported by the FPA system.

Implementation Expectations: FPUs should expect to implement their fire management program through an organization that is "close" to the optimal solution. Stated another way the real world organization should have similar capability to the model world solution. It does not have to be the exact solution as identified by FPA-PM. Our real-world organizations contribute to the full array of fire management program components (extended attack, large fire support, fuels management etc.) The first phase of the FPA model only analyzes the initial response part of the fire management program. Although changing the mix of staffing and resources in existing organizations is always difficult, such changes might occur at any time if Congress increases or decreases wildland fire budgets for reasons having nothing to do with FPA. FPA will provide an objective basis for change, and empowers local FPUs to develop plans for phasing in changes and modifying the FPA-identified mix of resources with proper rationale.

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The FPA development team and FPA Steering Committee have long recognized that the FPA solution cannot and should not be instantly implemented. National and local transition strategies need to be developed, [the National Transition Strategy document is on the FPA website]. The outgrowth of local strategies will be detailed transition plans, which provide a rationale built on the FPA results that transition the current fire management organization into a more cost-effective organization of the future.

References:

[1]Starfield, A. M., K.A. Smith, & A.L. Bleloch. 1994. *How to Model it: Problem solving in the computer age*. New York: McGraw Hill, Chapter 1.

[2]Rideout, Douglas. 2004. Personal Communication with FPA Core Team.